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Declass Review by NGA.

14 April 1967

REGISTERED

U. S. Government

Subject: Request for Proposal No. RD-14-67
Project No. 02057

Gentlemen:

[redacted] is pleased to quote on Subject
Request for Proposal for a Digital Control Console for use
on an On-Line Measuring System.

The enclosed Technical Proposal and cost quotation on
DD Form 633-4 is for one (1) each Digital Control Console
and is based on a fixed price type contract.

Delivery of this unit can be made 90 - 120 days after receipt
of Contract.

If you should require any additional information, contact the
undersigned or [redacted] Contracts Administrator at

[redacted]

Very truly yours,

[redacted]

General Manager

WJW:vmk IN 859

Enclosures:

Technical Proposal
DD Form 633-4
Cover Letter with all enclosures

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Approved For Release 2005/05/02 : CIA-RDP78B04770A002200010029-7

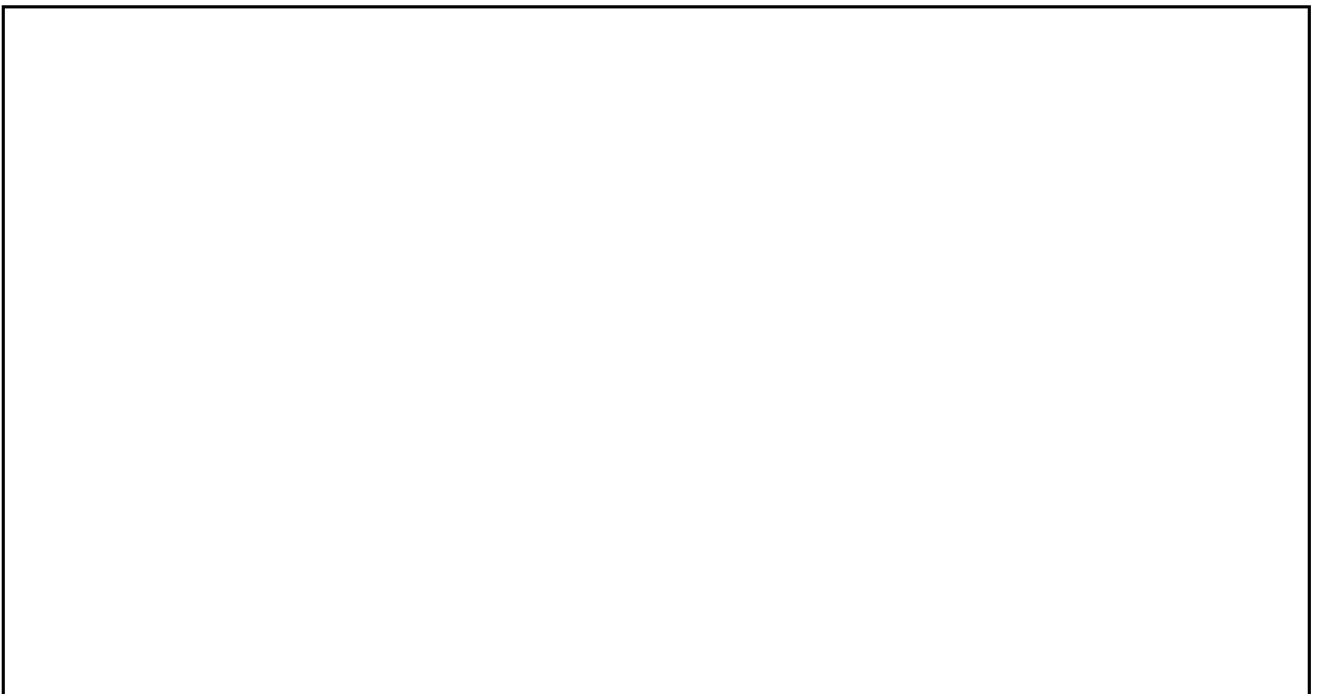
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TECHNICAL PROPOSAL

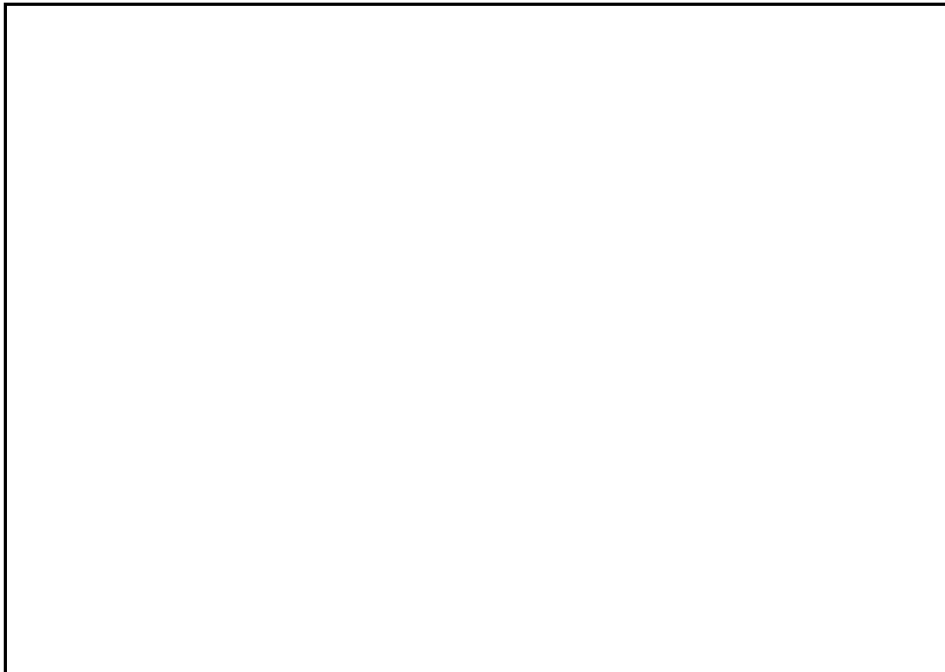
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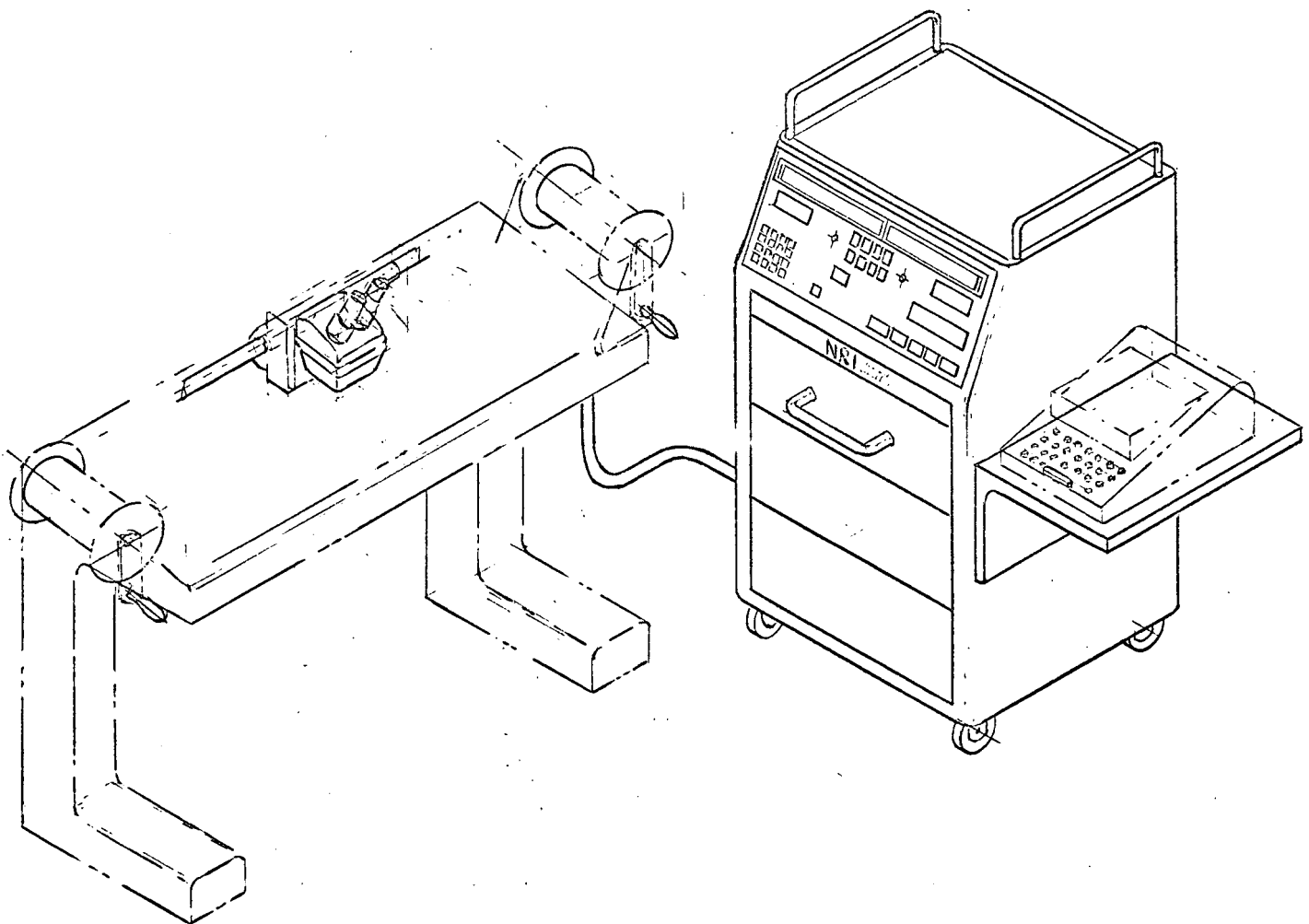


12 April 1967

I.N. 859

TECHNICAL PROPOSAL
DIGITAL CONTROL CONSOLE FOR USE
WITH AN ON-LINE MEASURING SYSTEM





Synchronizer Digital Control Console

1. INTRODUCTION

This proposal is prepared in response to Request for Proposal from the United States Government for design, fabrication and delivery of one operational prototype Digital Control Console for use with an On-Line Measuring System. Technical data were prepared by the Engineering Staff [REDACTED]

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1.1 REQUIREMENTS

This proposal describes the technical aspects in designing, fabricating and integrating one Digital Control Console electronic system for converting the output of two [REDACTED] Digital Linear Measuring System "DIG" reading heads into a format suitable for an existing data link to a central computer. The console control panel will be similar to existing equipment to simplify training.

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1.2 STATEMENT OF WORK

[REDACTED] hereinafter referred to as [REDACTED] proposes to furnish the following hardware and software as specified in the Development Objectives:

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- 1) One digital electronic data conversion system housed in a portable cabinet
- 2) One integral visual display panel
- 3) Support documentation
- 4) Overall system integration with a Government-furnished Univac Model 494 On-Line Computer.

1.3 CONTRACTOR QUALIFICATIONS

[REDACTED] is eminently qualified in Precision Film Measuring Instruments, having performed feasibility studies, research, and development of such instruments since the founding of the Company. Current efforts in photo-analysis technology include in-house and Government sponsored programs for similar stereo-viewing film measuring instrumentation.

1.4 SUMMARY

25X1 [] proposes to fabricate one Digital Control Console electronics system housed in a standard electronics cabinet. The control panel with an integral visual display will be mounted on the cabinet. The electronic circuits will convert the encoded data from the [] reading heads and the control panel into a signal acceptable to an in-house on-line computer through a dataphone link. Reports will be prepared according to Specification No. DB-1001. Instruction Manuals and parts lists will be furnished as negotiated contractually. 25X1

2. TECHNICAL DISCUSSION

The proposed system components are largely modified standard [] items requiring minimal efforts in packaging for portability and for ease of operation and maintenance. Components include the input devices and signal processing devices described in the following subsections. 25X1

2.1 MEASUREMENT READOUT

25X1 To meet the measurement readout requirements of the Digital Control Console, the [] "DIG" system is proposed. One digitizer subsystem will be associated with each axis of a traversing microscope. The operator will be able to read the coordinate data output at any time on the Nixie tube display. He will have the option of presetting any number into the display, or resetting the display to zero. Coordinate information, along with required instructions, will be sent upon operator command to a computer which will send back data to a teletype printer. The computer will be tied directly to the coordinate buffer storage. The connection is through a dataphone link. Electronics necessary to put the coordinate information and compute instructions in format suitable for serial transmission will be supplied.

2.1.1 "DIG" System

The basic DIG system consists of three major components - a scale (GFE), a reading head (GFE), and an electronics package with readout display.

The scale consists of a glass base with accurately placed reference marks every millimeter. In addition there are coarse code tracks to identify each reference mark, in order to give an absolute measurement capability.

The reading head reads the coarse scale coded markings, and in addition it interpolates between its own reference position and the next nearest millimeter marking. By dividing the distance between 2 adjacent markings into a thousand increments, a one micron least count is obtained. Readings are obtained and updated every 100 milliseconds.

The electronics package provides for the buffered storage of each axis (microscope) coordinate readings, and for the Nixie tube display of this data. In addition, presetting is provided for, as is zero setting. Output in the form of 4 line BCD code is available from the electronics. Display will be on Nixie tubes.

Each axis of the microscope will display a plus or minus sign, followed by 6 digits, which represents the coordinate position of the axis in microns.

2.1.2 Input Devices

The input devices will be reading heads and panel-mounted operator controls. Two "DIG" reading heads (GFE) will be used as specified in the Development Objectives. Each reading head will generate a coded signal to identify position of that read with respect to its axis. One reading head will be supplied to the contractor for checkout.

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The ☐ control panel is similar to and compatible with the Computer Measurements Company Model 2825A. The panel controls and flush-mounted thumbwheel switches enable the operator to preset the counters and feed auxiliary data to the computer. The digital display on the panel shows the relative position of each of the reading heads. A typical ☐ control panel is shown in Figure 1.

Display of X and Y coordinates, preset switches, counter control switches, indicative data thumbwheel switches, transmission and alarm lights, special instruction character and readout character switches will all be located on the control panel.

2.2 SIGNAL PROCESSING SYNCHRONIZER

The signal processing device is a Synchronizer for a direct communication link between the coordinate measuring equipment and the central computer. Transmission cables (GFE) will be two PWC S4193 or equivalent. One cable connects the computer and Synchronizer. The synchronizer enables data link communication to a centralized computer and provides the exact format required for bit serial transmission to the computer of all the requisite data. In addition the Synchronizer generates parity bits both lateral (character by character) and longitudinal as required.

The electronics is assembled in standard racks, and will consist of standard off-the-shelf printed circuit boards with integrated circuit modules of the DTL (Diode Transistor Logic) type. These boards have test points for rapid trouble isolation. Data Technology boards and bins, are considered because of their quality, board configurations, and circuitry distributions. Level shifters are provided as required.

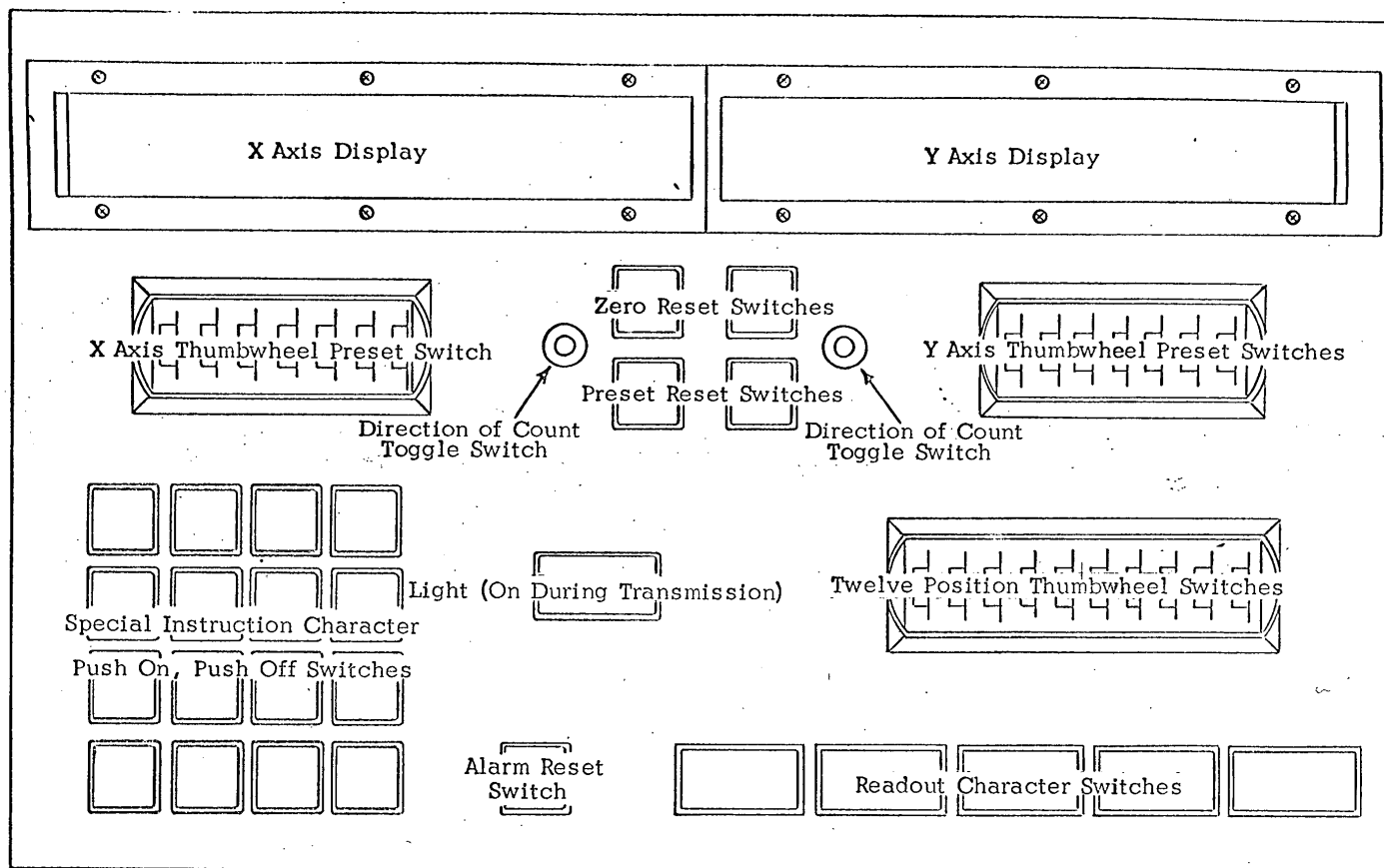
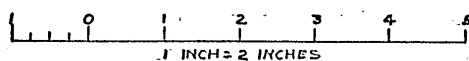


Figure 1 CONTROL PANEL (Typical)



2.3 COMPUTER INTERFACE

The transmission interface, code requirements, message format, circuit and operational data will be fabricated as specified in Paragraph 3.2 in the Development Objectives.

The coordinate information stored in the buffer registers will be transferred upon command to the computer if selected. ☐ will supply the necessary gating and interfacing between the "DIG" buffer storage and the existing on-line computer described in the Design Objectives. A sign bit will be included in the format, and the numerical input will be in Binary Coded Decimal form. The computer will be programmed to make the conversion to binary for its internal computations.

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Auxiliary inputs to the computer will be by means of a typewriter keyboard, under operator control. Computation time for each set of coordinate readings is expected to be less than one second.

2.4 PHYSICAL REQUIREMENTS

Physical requirements include standard precision solid state circuits on plug-in cards. The cards will be selected for required performance demands with inherent reliability, easy removal, and replacement. Cabinet design includes standard rack mountings housed in a caster-mounted electronics enclosure. The operator control panel is slanted for easy viewing; switches are thumbwheels for flush mounting; numerical displays are Nixie tubes. Additional considerations include operation from standard commercial 115 volt, 60 cycle power at 15 amperes.